

Getting Loud Now; Enjoy Peace and Quiet Then

Written by Larry Nelson

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NASA Dryden pilot Nils Larson and flight engineer Mike Holtz prepare to taxi out in a NASA Dryden F/A-18 for another SCAMP flight in front of a TG-14 motorglider also flown in the project in the background.

In an ironic twist, NASA is using supersonic aircraft to produce amped-up, super-loud sonic booms in an effort to understand how to minimize their startling impact and thereby be able to

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design future quiet supersonic aircraft.

NASA Dryden says the ultimate goal is to allow supersonic transportation over land through the *Superboom Caustic Analysis and Measurement Program*, or SCAMP, at NASA's Dryden Flight Research Center in California.

Researchers recently employed a two-mile long string of microphones to record the thunder of an accelerating F/A-18 jet for the SCAMP project. An Edwards Air Force Base staff biologist experienced with desert environments helped keep the project's sensor locations away from sensitive species.

When a supersonic aircraft accelerates to its cruise speed, a focusing effect occurs that makes the sonic boom five to 10 times louder than its normal cruise sonic boom over a small region. This effect is similar to how light rays are focused by a lens.

SCAMP measured these focused booms to help ensure that tomorrow's supersonic jets are quiet in all phases of flight, including acceleration. The data represents 13 flights that generated 70 sonic boom events.

The measurements will be used to validate computer prediction tools that will be used in the design of future quiet supersonic aircraft. If the predictive tools can accurately mirror the louder-than-normal booms that were generated through SCAMP, then researchers will have confidence that they are capturing the right acoustics and aerodynamics effects, and they can then be used with confidence to guide the design of supersonic aircraft whose sonic booms are quieter than have ever been achieved before.

The complex effort involved several partners including Dryden, NASA's Langley Research Center in Virginia, Wyle Laboratories, The Boeing Company, Northrop Grumman, Cessna, Gulfstream, Central Washington University, Penn State University, Eagle Engineering, MetroLaser, Inc., and Seismic Warning Systems Inc.

It may seem a little non-intuitive to make lots of sonic boom noise in learning to quiet them, but it's proving effective in helping engineers understand what they need to do to design low sonic boom-producing aircraft.